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The Authenticity-Anxiety Paradox: The quest for authentic second language communication and reduced foreign language anxiety in virtual environments

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Abstract

In this amplification of an earlier comparative study into technical and foreign language anxiety in a virtual environment and the traditional classroom, the authenticity of the virtual environment and of the communicative interaction that occurs within that environment stand out as a significant factors associated with reduced foreign language anxiety. Students' feelings about the authenticity of typed text-chat and of communication with their non-player character interlocutors in the virtual environment in comparison to real world communication is highly related to the foreign language anxiety they experience: the more similar they perceive these two contexts, the more likely they are to transfer feelings of anxiety related to speaking a foreign language to the virtual environment, even though perceived similarities between the real and virtual world were found to lead to greater engagement in learning in the virtual environment.

Keywords: Foreign language anxiety; second language communication; virtual environments

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1. Introduction

Previous research has shown that foreign language anxiety (FLA) can have negative effects on learner performance and learning outcomes [1, 2, 3, 4, 5, 6, 7]. FLA is defined as "a situation-specific anxiety, similar in type to other familiar manifestations of anxiety such as stage fright or test anxiety" [8].

Research into FLA has a relatively long history, dating back to the early 1970s. In a meta study laying out the time line of FLA research over this period, Horwitz [8] cites 44 milestone studies that examine FLA from a range of perspectives, noting that many more examinations of FLA in specific learner populations were not able to be included in the meta study. Horwitz notes that while earlier studies focused on the unique nature of FLA in relation to other types of anxieties and its effect on language learning outcomes, later studies look more at sources of FLA, its variations under different learning conditions [9, 5], its relationship to other factors [3, 10, 11], anxiety in relation to other aspects of language learning (e.g. reading and writing) [12,] and instructional strategies to reduce anxiety levels [8]. Hewitt & Stephenson argue that continued research into FLA matters because "not only has anxiety been found to be an outstanding variable in language learning but also it is a variable that may allow for intervention or remedy" [13:170]

In "Language Learning in Virtual Worlds: The Role of Foreign Language and Technical Anxiety" [14], preliminary findings on the relative levels of foreign language anxiety (FLA) and technical anxiety (TA) felt by students in an online 3D multi-user virtual environment (MUVE) simulation compared to the real world classroom were reported. The study concluded that (1) there are there are multiple sources of FLA in both classroom and virtual environments; (2) students found the virtual environment less stressful in terms of language use and (3) students, at least in this group, did not have a significant inherent level of technical anxiety. To paint a more fine-grained picture of these findings, this paper looks in detail at correlations between a range of different factors, triangulating these findings with qualitative feedback from open ended questions included in the surveys.

2. The study background

The two-part study was conducted as part of a regular 1.5 hour beginner level Chinese language computer laboratory class. Students use language learned in the regular classroom to interact with conversational agents (non-player characters or NPCs) and other scripted artifacts in a 3D virtual Chinese township situated in the online MUVE of Second Life (SL) to complete communicative tasks. The lesson during which the study was conducted was the third of a series of three such lessons conducted during the semester. In total, 62 respondents completed a pre-lesson online survey made up of 52 items that covered demographic information, computer and text-chat usage, and learner feelings about learning Chinese in general and in the classroom specifically. Language related questions used a modified version of the Foreign Language Classroom Anxiety Scale (FLCAS) [2]. Additional questions on computer and text-chat use were drawn from the multi-item scales developed by Brown et.al. [15]. A total of 55 respondents also completed a post-lesson survey comprised of 37 items relating to the use of Chinese to complete the set task in the MUVE setting and to levels of technical anxiety experienced that were associated with the use of a computer and software interface to access the MUVE. A five-point Likert scale was used for both surveys, with 1 being strongly agree and 5 strongly disagree.

Respondents were roughly half female (51.6%) and half male (48.4%), mostly undergraduates aged 18-20. For most (64.5%), Chinese was taken as an elective - a single unit in a degree. Around two-thirds had previously studied another second language before undertaking this course. Many indicated that they spent between 2 to 4 hours a day using computers (42.5% of students), or even longer (37.1%), and most of this time was spent online. Email, study, watching or downloading music or movies, and social networking (each undertaken by over 80% of students) were the most popular activities online. Less than a third of students, however, played 3D games like World of Warcraft, and an even smaller proportion (12.5%) engaged in other 3D environments like Second Life, Entropia, etc. Only 12.5% of students played games daily, 16.15% weekly, and 8.1% monthly. Almost half of students indicated that they had played games in the past, but not anymore, and a further 14.5% stated that they had never played any kind of interactive video game either on or offline [14].

3. Research questions and the analysis

For the purposes of the present paper, two research questions were formulated. These questions are:

1. Is there significant difference in student's FLA in different settings, that is, in lessons in the face-to-face classroom setting versus the online 3D MUVE?
2. Do students' perceptions of (a) the similarity between typed conversation in SL and spoken conversation in the real world, (b) the similarity between communication with pre-programmed NPCs and with a real person, and (c) the authenticity of conversations with NPCs, correlate to their experiences of FLA in the MUVE environment?

During the quantitative analysis, we matched the pre- and post- lesson data and conducted paired T-tests to examine the statistical differences in students' FLA in the two different settings identified (i.e." face-to-face classroom" and "online 3D simulation environment" or MUVE).

In addition, 2-tailed Pearson Correlations were used to examine the effects of student's feelings about the authenticity of language learning and use in the 3D virtual simulation environment on their experiences of FLA. In particular, tests were carried out on the statistical significance of correlations between students' feelings about the similarity between typed text and spoken communication, the similarity between communication with NPCs in the 3D simulation environment and with a real person, and the authenticity of communication in the 3D simulation environment and students' FLA in that environment. In total, 62 students completed the pre-lesson questionnaire on FLA in the face-to-face classroom setting while 55 of them completed the post-lesson survey on FLA in the online 3D simulation environment. Therefore, 55 participants' response were utilised as the data source for addressing the above research questions.

In addition to the quantitative questions described above, each survey included two open-ended questions. Four of the 62 students who undertook the pre-survey opted to provide additional, qualitative comments under the section "Please feel free to add any other comments about computers and or text-based chat". One of the four was a greeting and did not constitute a valid response to the question, and so was discounted. Analysis of the remaining three students' comments (given the initials C, G, and S) was undertaken via a thematic coding. Only one of the 62 students who undertook the pre-survey opted to provide additional comments under "Please feel free to add any other comments about face to face language learning in the classroom" (this was student G).

In the post-survey, eight of the 55 students who completed this portion of the research provided an answer to the question "Please feel free to add any other comments or impressions you have about the online 3D simulation environment and the tasks and communicative interactions you conducted in the environment and how you felt in comparison to classroom-based work". Of these eight, three of the students (C, G, and S) had also provided comments in the first survey. The other five students were given the initials A, B, L, M, and Z. Three students (A, G and L) provided answers to the final open-ended question, "Please feel free to add any other comments or impressions you have about the online 3D simulation environment and the tasks and communicative interactions you conducted in the environment and how you felt in comparison to classroom-based work". Brief descriptions of each of the eight participants for whom qualitative data are available are given in the table below.

Table 1. Brief description of participants.

Participant Initial	Description	Pre1	Pre2	Post1	Post 2*
A	A female over 26 years of age, 1st year B.A. student undertaking Chinese as an elective			✓	✓
B	A female in her late teens, 1st year B.A. student with a Chinese minor			✓	
C	A female in her early 20s, 4th year B. Comm./B.A. student completing a minor in Chinese	✓		✓	
G	A male in his late teens, 1st year Bio.Med.Sci. student undertaking Chinese as an elective	✓	✓	✓	✓
L	A female in her late teens, 2nd year B.A. student undertaking Chinese as an elective			✓	✓
M	A female in her late teens, 2nd year Business Marketing student undertaking Chinese as an elective			✓	
S	A male in his late teens, 1st year B.A. student with a Chinese major	✓		✓	
Z	A female in her late teens, 1st year B.A. student studying Chinese as part of a first-year sequence			✓	

*Indicates how many of the qualitative questions each student provided a response for.

4. Results and Interpretations

4.1 Research question 1

Research question 1: Is there significant difference in student's foreign language anxiety (FLA) when they have Chinese class in different settings, that is, in the face to face classroom settings and in an on-line 3D MUVE?

Before actual examination of the differences between settings, reliability tests were conducted for the answers in each setting. All Cronbach alpha coefficients were higher than .07 (.86 for FLA questions in classroom settings and .91 for FLA questions in virtual settings), showing that the corpus of data was reliable in terms of internal consistency.

Table 2 displays the descriptive results of FLA in the two settings. In order to examine whether there is a significant difference in student's FLA when they study face-to-face versus in an online 3D MUVE, all the matched data (N=55) were processed using Paired T-test, the results of which are also presented in Table 2.

Based on the results shown in Table 2, we found that:

1) Students felt less anxious about studying Chinese in the online 3D MUVE than in a face-to-face classroom (all $p<.05$ with very large effect size with all $eta^2>.16$, Cohen, 1988) across a range of different tasks (e.g., *communicating in Chinese in class or with native speakers*, Items 1, 3, 10, 16, 19, 20, 22; *understanding Chinese*, Items 4, 11, 21; *making mistakes when using Chinese*, Items 2; *whether they are well or not prepared for the lessons or questions*, Items 8, 12 and 24 respectively; *conducting work with or in front of other students*, Item 17; *when the class pace is bit quicker*, Item 18; *when native speakers of Chinese are around*, Item 23; or *in general when using Chinese*, Item 9). This confirms the findings of our earlier paper.
2) Students felt more *confident in their own Chinese* (Item 7) or in *speaking Chinese* (Item 14) and *more engaged in the tasks* (Item 6) (all $p<.05$ with very large effect size, $eta^2>.16$,) in the on-line MUVE simulation as compared to the face-to-face classroom.
3) Among the 24 questions, there was no statistical difference between the two learning settings for only three questions (Item 5, 13 and 15). However none of these questions directly deals with FLA. From Item 5, we can see that students in fact *don't mind having more Chinese classes in either environment* (both mean>3.5 out of 5), which is consistent with the result from Item 13 where students *disagree with the statement that they often feel like not going to Chinese class in either of these two settings* (both mean <2.5 out of 5). According to the results of Item 15, many students (31 out of 55 students in classroom setting and 35 out of 55 in simulation setting) would *not really mind if their mistakes are corrected by either the teachers or the NPCs* (both mean <2.5 out of 5). In other words, in either the real or virtual environment, most students want their mistakes corrected.

Table 2. Descriptive data and Paired T-test of FLA in classroom and in on-line simulation 3D simulation environment

Questions	In face-to-face classroom		In simulation environment		t	*p*	*eta²*
	mean	std.	mean	std.			
1. I never feel quite sure of myself when I am speaking Chinese	3.55	0.77	3.15	0.97	-3.11	0.003 *	0.152 +++
2. I don't worry about making mistakes in Chinese	3.00	1.05	3.95	0.83	5.73	0 *	0.378 +++
3. I tremble when I know that I'm going to be called on (or communicate)	3.11	0.99	2.18	1.16	-5.22	0 *	0.335 +++
4. It frightens me when I don't understand what the teacher (NPC) is saying in Chinese	3.13	1.02	2.36	0.97	-5.21	0 *	0.334 +++
5. It wouldn't bother me at all to take more Chinese classes	3.73	0.95	3.76	0.94	0.21	0.833	0.001

6. I find myself thinking about things that have nothing to do with the course during Chinese class	2.69	0.98	2.27	0.87	-2.56	0.013 *	0.108 ++
7. I keep thinking that the other students are better at Chinese	3.40	1.08	2.60	0.95	-5.79	0 *	0.383 +++
8. I start to panic when I have to speak without preparation (or communicate with NPCs).	3.33	1.07	2.22	1.01	-6.40	0 *	0.431 +++
9. I can get so nervous I forget things I know.	3.13	1.04	2.13	0.94	-6.25	0 *	0.420 +++
10. I would not be nervous speaking Chinese with native speakers.	2.69	0.94	3.18	0.96	3.30	0.002 *	0.168 +++
11. I get upset when I don't understand what the teacher(or NPC) is correcting	2.85	0.85	2.38	1.06	-3.58	0.001 *	0.192 +++
12. I feel anxious about Chinese class even if I am well prepared for it	2.84	1.15	2.24	0.98	-3.54	0.001 *	0.189 +++
13. I often feel like not going to my Chinese class face-to-face in the classroom / in the online 3D simulation environment..	2.36	1.09	2.20	1.08	-1.01	0.316	0.019
14. I feel confident when I speak Chinese (or converse with NPCs by typing Chinese)	2.82	0.80	3.62	0.85	6.51	0 *	0.440 +++
15. I am afraid that my Chinese teacher (or the NPC) is ready to correct every mistake I make.	2.44	0.98	2.20	1.01	-1.75	0.085	0.054
16. I can feel my heart pounding when I am going to be called on (or start a conversation with an NPC in Chinese)	2.82	1.00	1.96	1.09	-4.78	0 *	0.297 +++
17. I feel very self-conscious about speaking Chinese in front of other students (or typed conversations in Chinese with other students)	3.09	1.09	2.16	0.90	-5.34	0 *	0.345 +++
18. Chinese class moves so quickly (or reading the Chinese response by NPCs takes so long) that I worry about getting left behind.	3.11	1.01	2.71	1.05	-2.79	0.007 *	0.126 ++
19. I feel more tense and nervous in my Chinese class than in my other classes	2.87	1.14	2.24	0.96	-3.49	0.001 *	0.184 +++
20. I get nervous and confused when I am speaking in my Chinese class	2.71	0.96	2.27	0.85	-3.25	0.002 *	0.164 +++
21. I get nervous when I don't understand every word the Chinese teacher (or NPC) says]	2.85	0.99	2.31	0.94	-3.92	0 *	0.221 +++
22. I am afraid that the other students will laugh at me when I speak Chinese	2.38	1.13	2.07	0.96	-2.49	0.016 *	0.103 ++
23. I would probably feel comfortable around native speakers of Chinese.	2.80	0.89	3.02	0.89	1.26	0.214	0.028
24. I got nervous when the Chinese teacher (or Chinese NPCs) asked questions which I hadn't prepared in advance	2.98	1.05	2.25	0.95	-4.20	0 *	0.246 +++

**p*. <0.05 Significant; +Eta^2: >0.01 small effect; >0.06 moderate effect; >0.14 large effect;

4.1.1 A Case Study: G's Self-Consciousness in Speaking Chinese

As the only student to answer all qualitative questions in both the pre- and post- surveys, G's detailed answers present an excellent case study of the effects of self-consciousness and anxiety in both the classroom and online environment. G, a male in his late teens and a 1st year Bio-Medicine Science student undertaking Chinese as an elective commented "I often feel conscious of my Chinese skills, but I am keen to learn and develop my skills, so I am happy to put myself in situations where I have to speak with native speakers". This evaluation of his overall feelings in relation to using Chinese appears consistent with his self-evaluations in the quantitative sections of the pre-survey. Although most of his responses to the survey data indicated that he did not experience anxiety in relation to computer use (strongly disagreeing that computers and/or live text-based chat made him uncomfortable, give him a sinking feeling, or make him feel nervous, and conversely, agreeing that he feels comfortable, understands how to use them, is experienced, familiar with typing, likes and looks forward to using live text-based chat), G's responses in relation to language learning and language use were far more conservative, with a large number of neutral

responses (8/24) and only two answers at the ends of the Likert scale (strongly agreeing that he would not be bothered by undertaking more face-to-face classes, and strongly disagreeing that he ever feels like not attending class).

In the post-survey, G again indicates a sense of reduced anxiety in the virtual environment. He indicated that he felt the conversations he experienced in the virtual lesson were "authentic", i.e. the types he would expect to encounter in real life, which appears consistent with his goal of developing his skills in order to be able to communicate with native speakers. Quantitative findings in relation to perceptions of authenticity are discussed in the section below. G also indicated that typed conversation had some similarities to spoken conversation, therefore providing transferable skills, another theme picked up in the following section. Although G had stated in the pre-survey that he was often "conscious" of his Chinese skills, after participating in the virtual environment, he indicated that he did not feel very self-conscious, nervous, frightened, worried or upset in relation to language use in the 3D world. These qualitative findings, further confirmed the quantitative findings analysed above, suggest that students experienced less anxiety in the online as opposed to the face-to-face lesson setting.

4.2 Research question 2

Research question 2: Do students' perceptions about (a) the difference or similarity between typed conversation in SL and spoken conversation in the real world, (b) the similarity between communication with pre-programmed NPCs and with a real person, and (c) the authenticity of conversations with the NPCs, correlate to their experiences of FLA in the MUVE setting?

The 2-tailed Pearson Correlations tests revealed that:

1) Student's feelings about whether typed text-chat in SL is similar to spoken communication in real world was significantly correlated with Items 6, 7, 11, 13 and 19 (all $p<.05$, N=55). This means the *less students feel typed text-chat in SL is similar to real world verbal communication*, the *less they engaged in the Chinese lesson in SL* (Item 6), the *more confident they feel in their own ability (or the less confident they feel in the ability of other students)* (Item 7), the *more upset they are when they don't understand the corrections by NPCs or the teacher* (Item 11), the *less they feel like participating in SL lesson* (Item 13) and the *less nervous they feel about communication in the Chinese class in SL* (Item 19, $r = -.276$).

The fact that some students do not feel that text-chat in the virtual environment is similar to spoken communication in the real world, and are therefore less engaged and feel less like participating in lessons in the virtual environment, could reflect a view that they will gain less that is of practical communication value in real life from these text-chat interactions than from real world conversations and that they do not see a connection or transferability between the two. However, it is interesting to find that students' perception of typed text-chat is so closely related to their confidence of learning in virtual worlds: the feeling of similarity between the typed chat and verbal communication is positively correlated to their confidence and less anxiety in communication (item 7 and 19). This indicates a very important role for typed text in reducing students' FLA in the virtual world context, which, nevertheless, leaves an interesting research question for future investigation as to whether verbal communication in a virtual world would generate the same effect as typed text-chat in terms of FLA. Moreover, it may be that greater efforts to highlight the connection and transferability between the two modes of communication, which has been indicated in past research [16, 17, 18, 19, 20], could increase student motivation to participate in this type of lesson, although the trade-off at least for some students may be increased FLA.

Of the three students who provided general evaluations of text-based chat use, two were overall positive. C, a female 21-23 year old, 4th year Bachelor of Commerce/Bachelor of Arts student completing a minor in Chinese, stated that she "really enjoyed using text based chat whilst travelling". However, she went on to comment that in general, she preferred face-to-face communication where possible; "I do not prefer to use this when I have the option of communication in person". This appears to be a personal preference, rather than one that stems from a computer-related anxiety, as her responses to the quantitative portions of the survey do not indicate that C is uncomfortable with computers. Another student to comment on text-based chat was G, described in the case study above, who described the potential for the use of such communication technology thus: "In my opinion, text-based chat would be a suitable medium for conversing with foreign language speakers to aid in the development of my

own foreign language skills, and conversely, their English skills". Finally, S, another male 18-20 year old 1st year, studying a Bachelor of Arts with a Chinese major, like C, mentioned enjoyment as a key factor, stating that "Second Life is a good initiative. I wish I could access it more".

In relation to Second Life text-chat specifically, in contrast with G, who described the interactions as "authentic", and stated that the typed conversation had some similarities to speech, L, a female 18-20 year old 2nd year Arts student undertaking Chinese as an elective was critical of the "realism" of interactions in the virtual environment. She indicated in her comment "when we make mistakes in the classroom, it's easier to point these mistakes out and correct [each] other right away so I find [it] much easier to learn in this [the real classroom] environment". L's comments may also provide an insight into why some students with this view of the lack of similarity between text-based interactions and spoken communication are more upset when they do not understand corrections made by the NPCs or the teacher in the virtual environment learning context (corrections happen more easily in the real classroom). Further, learner perceptions of their own learning needs play an important role in their evaluation any learning environment. C, a female 21-23 year old, 4th year Bachelor of Commerce/Bachelor of Arts student completing a minor in Chinese, did not perceive a benefit that would flow through for listening or speaking, stating that Second Life "helps with vocab and grammar but obviously not verbal communication or listening which I have the most trouble with".

In terms of feeling less anxiety about communicating in Chinese in the virtual world environment, for students like L and C who feel their main needs are not being met by the communicative interactions in the virtual environment, their preference for real world verbal interactions could explain their lack of anxiety about a form of communicative interaction that they do not value highly.

2) Student's feelings about whether communicating with NPCs in SL is similar to communication with a real person is highly correlated with Item 5, 6, 13 and 23 (all $p<.05$). Such results indicate that the *more they feel communication with NPCs is similar to that with real person*, the *more classes they feel like having in SL* (Item 5, $r =-.315$), the *more they engaged in Chinese lessons in SL* (Item 6), the *more they feel like participating in SL lesson* (Item 13), but the less *comfortable they feel around NSs of Chinese when NSs converse in text-chat* (Item 23).

The first three correlations in this finding reinforce the findings in 1) that perceived "realness" is closely associated with positive motivation in terms of participation and engagement (i.e. the belief that this will be useful in preparing for real life communication). The greater anxiety felt around native speakers (NSs) of Chinese when they converse in text-chat may reflect the distinction students make in their minds between the static NPCs which they generally know are not "real people" and live NSs. In some ways this is to be expected and possibly highlights the role of NPCs in providing authentic communication opportunities while at the same time reducing anxiety levels relative to those that might be experienced when communicating with a live NS.

While not all students perceived communication with the NPCs as being the same as with real NSs (26%, 14 of 55 think negatively while 22 out 55, that is 40% holding a neutral attitude), some students clearly do see value in the conversational interactions with the NPCs as preparation for real life communication (16 out of 55, about 29%). For example, A, a female 26+ year old in 1st year, studying Chinese as an elective in a Bachelor of Arts, valued interaction with the NPCs as a substitute for face-to-face language practice commenting " As someone who doesn't really have anyone to practice Chinese with I feel that the lab classes allow me to use what I have learnt in a real life setting" and B, a female 18-20 year old 1st year Bachelor of Arts student with a Chinese minor commented " I find these tasks helpful for practicing using the language and they will prepare me to use Chinese in practical situations. Practicing these situations in a 3D environment will make me less nervous if I come across these situations in real life". G, the male 18-20 year old 1st year Biomedical Science student undertaking Chinese as an elective who appeared in the case study in the previous section, commented that he felt the conversations he experienced in the virtual lesson were "authentic", i.e. the types he would expect to encounter in real life, which appears consistent with his goal of developing his skills in order to be able to communicate with NSs. He also indicated that typed conversation had some similarities to spoken conversation, therefore providing transferable skills. Clearly, however, for some students, only the real thing will do.

3) However no significance was found between the authenticity of the conversations with the NPCs and student's FLA in the simulation environment.

It is of interest that while many students think affirmatively about the similarity between the typed text chat and a real conversation (about 38%) and between communication with the pre-programmed NPCs and communication with a real person (about 29%), less than 15% (8 students of 55) believe that the conversation with the NPCs would be what they would encounter in real life. Most students (27 out 55, about 45%) hold a negative attitude, while about 1/3 (17 out 55) are neutral. While "authenticity" in language learning relates often to the perceived similarity of a conversation to one in "real-life", in the MUVE setting, extra-linguistic factors may also have a significant impact on perceptions of realism. Both linguistic and extra-linguistic factors are revealed in the comments discussed below.

Two students, A and B commented that Second Life was substantially similar to "real life". A, a female 26+ year old in 1st year, studying Chinese as an elective in a Bachelor of Arts, reflected on Second Life as a substitute for face-to-face language practice: "As someone who doesn't really have anyone to practice Chinese I feel that the lab classes allow me to use what I have learnt in a real life setting". B, a female 18-20 year old 1st year Bachelor of Arts student with a Chinese minor, stated that "I find these tasks helpful for practising using the language and they will prepare me to use Chinese in practical situations. Practicing these situations in a 3D environment will make me less nervous if I come across these situations in real life". It is clear that for these women, Second Life provided an important avenue for practicing their language skills, and in the case of B, a sense of preparedness for real-life practical situations. On the other hand, a further two students, L and C, observed differences between Second Life and real life.

L, as mentioned above, was the most critical, indicating that, despite the benefits in terms of memorising character readings and learning to pronounce words correctly, she "would feel much more comfortable and interacting with classmates felt more realistic than the interaction online". Her reasons included a perception that "when we make mistakes in the classroom, it's easier to point these mistakes out and correct [each]other right away so I find [it] much easier to learn in this environment", which was interesting, given A's comments that the teacher "does an excellent job of making the sessions interesting and is always there to help if we are having any problems", indicating that A may have placed more value on the role of the teacher, and L, on the role of her classmates. Indeed, A's quantitative responses support this interpretation, and indicate that while she felt no anxiety in communicating with the teacher in the classroom (5/5 relevant questions ranked neutrally) she did have some anxiety in communicating with or in front of her classmates in the classroom (2/3 relevant questions indicated an agreement with statements such as "I keep thinking that the other students are better at Chinese" and "I feel very self-conscious about speaking Chinese in front of other students face-to-face in the classroom"). L, on the other hand, was not at all worried about either other students' perceptions of her (3/3 relevant questions rated either neutrally or negatively) of the teachers' (5/5 relevant questions ranked neutrally or negatively).

Perhaps more important, however, were the physical aspects that L listed. She experienced "a lot [of] trouble with using the tools" to type characters, and said "spending too much time on the 3D environment made me really dizzy". L confirmed that it was these extra-linguistic physical aspects which made her prefer face-to-face learning in the final open-ended question in the post-survey, where she stated "using the keyboard and mouse to move around made me quit stress[ed] only because it made me really dizzy. I'm not very good with online games / technology, so I personally highly prefer the classroom-based way of learning". Indeed, L indicated in the quantitative section of her pre-survey that she had never played any online or offline video games before, and despite feeling fairly neutral about computer use over all, did not use the internet for anything other than email and study. Clearly, such physical drawbacks/disturbances and experiences of technical anxiety or lack of confidence will have the effect of decreasing both the enjoyment and realism/authenticity for students who suffer from such problems. C also made some observations about the perceived differences between real life and Second Life, despite her overall positive evaluations of experiences of using text-based chat mentioned previously. She commented that Second Life "doesn't create the same kind of high pressure environment like in a classroom", which may be viewed as a positive aspect for those students suffering FLA, however, C also went on to say that this means "you don't push yourself to the equivalent level". Interestingly, L and C also perceived some limitations in the kinds of learning and practice that Second Life is most suited to.

G saw the use of Second Life as one component of a "sound education", and stated that "Classroom, online, and real-world experience are all essential", drawing a distinction between the three, but viewing all as important. Yet, as evidenced in Z's comment that "it [Second Life] is great for basic learning but after a point would not be helpful", it is clear that students perceived limitations and differences between these types of learning, something which, as

previously mentioned, both L and C elaborated upon in their responses.

One of the positive aspects of the 3D online simulation environment for L was that it allowed her "to practise and memorise my character reading and how to pronounce the words accurately". It is obvious that, despite the difficulty L reported above in terms of typing the characters, she perceived this as an opportunity to test her knowledge of the correct reading and pronunciation of the characters, as knowing the right pronunciation/reading is essential in making the right characters appear on screen. However, C did not perceive a benefit that would flow through for listening or speaking, as mentioned above. In fact, looking at the results of the quantitative section of the post-test, C's perception appears to be fairly common – 27.5% of students felt that typed conversation was "nothing like" spoken conversation and therefore could not be compared (C herself strongly agreed with this statement), and 34.5% responded neutrally, leaving only 38.1% who saw a clear link between the two.

5. Conclusions

The study answered the first research question in the affirmative: students experience less FLA in the 3D MUVE environment than in the face-to-face classroom setting. This confirms the findings of the earlier paper. However, in answering the second research question a paradox has been thrown up. Students' perceptions of the authenticity of typed text and conversations with NPCs in the 3D MUVE environment compared to spoken communication and conversations with real interlocutors are highly related to the FLA they experience and their motivation to take advantage of the communicative opportunities provided in the 3D MUVE environment. Herein lays the paradox: the more they feel these two worlds are similar, the more motivated they are to engage with the classes and communicative activities in the virtual world but at the cost of feeling more anxious.

Teachers and developers must therefore consider this paradox when designing language learning activities in 3DMUVE settings. It is precisely their points of difference from face-to-face settings which may make 3D MUVE encounters less anxiety inducing for learners (e.g. anonymity, the removal of the pressure of performing in front of others, conversations in slow motion, and so on), however, it is their similarities to real life settings which may encourage student motivation (i.e. the belief that this practice will be useful for future real-life communicative situations) and perceived usefulness (i.e. the belief that skills practiced in the chat setting may help to improve verbal and aural skills). For teachers and developers, balancing these elements remains a significant challenge. For researchers this paradox presents an opportunity for further in depth research into, for example, the role of "facilitating anxiety" [13]. The results of such research could provide teachers and developers with the means to create an even more nuanced learning experience for students.

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